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REPRODUCTIVE FAILURE IN THE BULL—ITS DIAGNOSIS AND PROGNOSIS *

BY

D. H. L. ROLLINSON,

MINISTRY OF AGRICULTURE, VETERINARY INVESTIGATION CENTRE, READING

INTRODUCTION

In the widening of man's knowledge of the world, the understanding of the processes of reproduction in the mammal has come comparatively late ; and it was with the introduction of glass drops as lenses that living cells were first observed in semen. This great discovery is lost in obscurity, but it appears to be agreed that the credit should go to one Johan Ham, of Arnhem, who discovered the sperm when a medical student at Leiden. Ham, however, did not publish this discovery, but demonstrated living cells in the human semen to Leeuwenhoek who published the finding with due acknowledgements in the Philosophical transactions of the Royal Society of London in 1679. Leeuwenhoek continued the study of semen so that by 1683 he had demonstrated sperm in the semen of many animals, and could assert that the seminal animalcules impregnated the egg.

Then commenced about a century and a half of argument and theory as to the significance of the strange living cells, during which time they were variously thought to contain minute complete beings (reproduction *ex. animalculo*), or to excite the male to mate, or that they were the product of putrefaction, being parasitic and capable of reproduction by pairing.

In the 17th and early 18th centuries it had been realised that the seminal animalcules did not occur in sterile animals (Man, 1681 ; Geoffrey & du Cerf, 1704), but a preponderance of workers refuted the suggestion. Theory and discussion continued until 1824 when Prévost and Dumas demonstrated that the seminal cells are essential for reproduction and probably arise from the sex organs, being named spermatozoa in 1827 by von Baer.

Following the introduction of the cell theory, progress became more rapid, and a century ago it was becoming accepted that sperm were normal constituents of semen. The penetration of the ovum by the sperm of the frog was shown 97 years ago (23.3.1853), the final proof of equal participation of egg and sperm nuclei in fertilisation following in 1875–1879 (Cole, 1930).

In recent years, owing to many factors of which breeding for increased milk production and monetary value are the chief, the examination of bulls for fitness and ability to breed has become important for veterinarians and for some has taken the place of soundness examination in the horse. The reason and methods of bull licensing as at present practised, are well known, therefore I do not propose to deal with them and will confine myself to reproductive disorders.

REASONS FOR EXAMINATION

Subnormal fertility (infertility) and sterility, or complete inability to breed, are of common occurrence. In the case of the bull by the very polygamy of animal breeding, this is always a herd problem. There are, however, herd breeding problems due to generalised factors affecting many females at once, such as feeding (Hignett), or infection with *Brucella abortus*, *Vibrio foetus* or trichomonads. Hignett (1949) has suggested that a problem exists when 30 per cent. or more of the females are not in calf. Each case, however, must of necessity be judged on its merits, and I suggest the following practical points as worthy of consideration in evaluating the history of the bull.

Firstly, always insist on written evidence of the bull's age, age at first service, and service history.

Secondly, compare the records thus obtained, with those of other bulls on the same farm, or with artificial insemination if used.

Thirdly, compare the figures from one year to the next.

Frequently it is not possible readily to obtain the numbers standing to first service, and indeed occasionally one finds no written records. Under these conditions I find that three totals are useful ; these are :—

(1) The numbers of cows and heifers (separately if possible) served.
(2) The total number of services.
(3) The number of animals possibly in calf.

The essential knowledge to obtain, however, is the immediate previous history of the bull. One can, by taking too long a period of the records, be misled completely. One bull examined had given in the 12 months prior to visit, 98 services to cows, and left 22 in calf. When sub-divided into the respective half years, this animal's record for the first half shows 32 services on 22 cows, and 22 cows in calf, while the second six months showed 66 services on 23 cows, and none in calf.

Unfortunately, published records of fertile herds are rare, Baker and Quesenberry (1942) recorded the percentage of pregnancies in 4,710 cow-breeding years as 85·3 per cent., with a range of 69·4 to 93 per cent. In my experience, normal figures are typified by one Guernsey herd which has a range of 85 to 100 per cent., or 1·0 to 1·66 services per conception. The report of the New Zealand dairy board for 1944–45 shows an average figure of 68 per cent. conceptions to the first service, 21 per cent. to the second, and 7 per cent. to the third.

The current practice of buying bulls through sales of attested animals of particular breeds, frequently leads to awkward situations with regard to the infertile or sterile bull. The conditions of sale vary slightly, but in general the buyer has a minimum period, usually three months, within which a complaint may be made. With this time limit, it may happen that the buyer does not discover until too late that the bull is unsatisfactory. When performing examinations of bulls that have been purchased, it is of importance that the vendor should be informed that a query has arisen, and the bull is to be examined. The buyer's veterinary surgeon can render his client good service in this respect.

The group of cases where the bull is unable to serve a cow following sale and change of management, is perhaps the most difficult since psychological causes may then operate and veterinary opinions clash.

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Types of Failure

Inability to sire calves can be sub-divided into three groups. Firstly lack of sexual desire; this is rare *per se* in the dairy bull, but more common in beef bulls. It may be due to debilitating or painful illness or even acetonaemia. Secondly, normal desire but inability to perform service (*impotentia coeundi*). This may be due to poor growth and development in the young bull (immaturity), to congenital defects or to injury. Rubarth (1946) has shown that some cases are accompanied by peripheral nerve degeneration in the penis, with thickening of the perineurium and demyelination. Thirdly, normal desire and capacity, but inability to sire a satisfactory number of calves. This may again be due to congenital defects either of the testicles (Lagerlof, 1939; Erikson, 1939), the epididymis (Blom & Christiansen, 1949) or of the sperm themselves (Hancock & Rollinson, 1949), or to seminal deficiency acquired later in life.

It is of the utmost importance to realise, as Lagerlof frequently has pointed out, that bulls affected with genital infections are keen and able to serve. Although Williams, W. L. (1943), inclines to the view that in the acute stages, service will not be performed, Lagerlof has denied this, and our observations agree with Lagerlof's view. Thus, of the cases of inflammation seen, two of seminal vesiculitis (streptococcus Group G and haemolytic coli), two of epididymitis (due to *C. pyogenes*) and one brucella orchitis, service was immediate and apparently had always been so. One case of acute epididymitis ejaculated pure pus. Bendixen & Blom (1949) recorded a case of a bull in an artificial insemination centre with *Brucella ampullitis* which infected 71 per cent. of cows inseminated before suspicion was aroused. Agglutinins against *Brucella abortus* can readily be detected in bovine semen, and have been found in semen from two of 121 bulls.

Incidence of Reproductive Failure

In the United Kingdom, slightly over 130,000 bulls are kept for breeding. This figure has been steadily rising since before the war, but has shown a slight fall since 1945. Of these bulls, 104,000 (1948) are in England and Wales, and about 12 per cent. of these occur in the area in which I operate. In 1948, 32,305 licenses were granted in England and Wales.

The reasons for disposal of bulls in Great Britain have not yet been analysed, but it is apparent that any one of several important reasons may operate. Bulls may be slaughtered for any of the following: old age, the breeding policy, injury and disease other than those affecting reproduction, or reproductive failure.

In New Zealand, the dairy board reports (1945) that of dairy bulls culled, 10 per cent. were infertile and 2 per cent. were sterile. The latest figures of reasons for culling bulls (1942) show that 16 per cent. were sold for further use, and 16 per cent. because of the danger of inbreeding. In Sweden, on the other hand (Lagerlof, 1948), of 1,300 bulls, 20 per cent. were culled because of a low fertility rate.

The infertility and sterility rate in the bull appears, then, to lie in the region of 10 to 20 per cent. It must be remembered, however, that in the New Zealand survey, the Jersey breed predominates (79 per cent.) while in Sweden, the Swedish Highland breed is most frequent, whereas in Southern England, the chief breeds are the Shorthorn, Friesian and Guernsey.

Figures are available of all bulls slaughtered in Great Britain since 1941.

Table I

Year	England and Wales	Scotland	Great Britain
1941	31,581	6,073	37,654
1942	27,242	5,727	32,969
1943	34,108	5,683	39,791
1944	35,307	5,687	40,994
1945	32,740	5,976	38,716
1946	29,845	5,342	35,187
1947	26,866	4,497	31,363
1948	29,064	4,323	33,387
1949	28,572	4,630	33,202

These show an average yearly figure for England and Wales of 30,591 bulls, and for Great Britain an average of 35,918 bulls slaughtered. When the proportion deduced above is applied to these figures it would appear that the losses from infertile or sterile bulls amount to between 3,000 and slightly over 6,000 bulls per annum in England and Wales, or 3,600 to 7,200 bulls per annum in Great Britain.

No mention is made in the New Zealand figures of inability to serve, but a high proportion of those culled because of accidents (9 per cent.) will fall in this group. In Sweden, however, 33 per cent. of 1,300 bulls were culled for this reason (Lagerlof, 1948). Owing to the wide divergence of views on the proportion unable to serve, a reliable estimate of this cannot at present be made. In the two series of bulls examined at Reading the incidence has been 9 and 9·8 per cent. respectively.

Breeds Incidence and Types of Disorder

During the present investigations (excluding those reported by Haq, 1948) of 121 bulls examined, 82 were abnormal. The remainder are accounted for by many other reasons, some being used as normal controls, some examined to ascertain the spread of infections in herds. The numbers of each breed examined are: Shorthorn 26, Guernsey 18, Jersey 16, Friesian 15, Ayrshire 4, Hereford 1, Red Poll 1. These can be compared with the numbers of bulls of the different breeds licensed in the counties covered by the investigation, during 1948–49, for unfortunately the number of bulls in service in these counties is not readily available. A comparison of the proportional numbers of bulls of different breeds with the proportion of breeds among the cases examined, shows a close similarity except that a much higher proportion of Jersey bulls have been examined than would be expected, together with a slightly higher proportion of Guernsey bulls.

In the series of cases able to serve but not fertile (*impotentia generandi*), 43 (53·03 per cent.) were cases of testicular degeneration. Five cases of atrophy of the testicles occurred (6·17 per cent.).

Congenital defects account for 15 cases (18·51 per cent.) consisting of hypoplasia, eight cases (9·87 per cent.) which has been seen in bulls of the Jersey, Friesian, Guernsey, Hereford and Ayrshire breeds; decapitation of sperm in Guernsey semen, five cases (6·17 per cent.); aplasia of the epididymis and "knobbed" semen in a Friesian, one case each.

Inflammatory changes have been seen in six cases (7·4 per cent.). Included in this group was one case apparently of Roekl's granuloma affecting the epididymis.

Methods of Examination

In order adequately to assess the reproductive health of the bull, as many factors as can be determined must be examined, and the more elaborate the examination, and the more careful the interpretation of the findings, the more

accurate will be the diagnosis. The general management of the bull, his age, length of time on the farm, and the methods of feeding are all of importance. Since the bull is not entirely mature until about two years of age (Hooker, 1944), the age of commencement of breeding life is of importance. In the young bull, congenital defects are most likely to be apparent, such as aplasia of the ductus deferens or the epididymis; or under-development of the retractor muscles. Testicular hypoplasia and particular sperm defects in Friesians and Guernseys fall into this group.

On the other hand, disorders such as testicular degeneration atrophy and fibrosis of the testicles or extreme sluggishness at service are generally met with in older bulls.

In noting the fertility rate of the sire, it is of importance to discover the general methods used at service, since this may in part affect the subsequent collection of semen. Bulls which are not used to being led with a staff may fail to perform satisfactorily with the artificial vagina. On the other hand, some farmers make a practice of serving every female twice at each heat, and in the young bull this can make all the difference between a reasonable usage and excessive use. In testicular degeneration, the fertility rate may be anywhere between the two extremes of zero and 70 per cent. according to the severity of the changes. Most commonly it tends to be between 15 and 30 per cent. In most cases of testicular hypoplasia, no calves are sired, although occasionally a proportional fertility rate with a maximum of about 40 per cent. is possible. In Guernsey and Friesian bulls suffering from innate abnormal sperm, the fertility rate is zero at all times, no matter how good the other characters of the semen.

Lastly, enquiries should be made to find out the date of the previous service, since if a bull has been standing idle for two weeks or more, an inferior quality of his first ejaculation can be ignored.

Examination of the Prepuce

The prepuce is examined for the existence of any discharge, tumours, nodular lesions, or mechanical injuries, excoriation and thickening, or irritation with preputial hair, thistles, or from a hard floor. While palpating the prepuce, abnormalities of the anterior and posterior muscles should always be determined. In many cases, examination of the prepuce fails to reveal any abnormality and a preputial washing is advisable. The preputial washing besides helping to ensure clean samples of semen at collection, also reveals possible *T. foetus* infection, the predominant type of bacteria and leucocytes if present. Epithelial cells from the lining of the prepuce are always present, and may be shed in excessive numbers.

The method of performing a preputial washing is by the use of 250 ml. of sterile normal saline containing 2 per cent. glucose. This is introduced into the sheath from a 10 oz. medicine bottle *via* a flutter valve and a metal or glass nozzle. Recovery direct into the bottle after massaging is relatively easy. 15 ml. of the washing is centrifuged later for five minutes at 2,000 r.p.m. and the sediment examined. Normally leucocytes are absent or number only one or two per field when the centrifugate is examined with the one-sixth objective. In moderate inflammation they average about 18 to the field and in acute inflammation 36 or more per field. Apart from the squamous cells of the prepuce, cells from the middle layer and basal layer of the mucosa may occur. Normally the middle layers do not occur. In cases of deep-seated inflammation the cells from the middle and basal layers increase up to 16 and 2 per cent. respectively. The appearance and disappearance of the middle and basal layers in washings which do not show evidence of bacterial infection coupled with granular lesions of the prepuce is highly suggestive of infection with *T. foetus* (Haq & Rollinson, 1948).

Semen Collection and Service Behaviour

The essential requirements for field collection of semen are a quiet and easily controlled teaser cow and adequate hot water. While the use of a cow in heat is desirable, waiting for a suitable animal can cause serious disruption of other work, and about 90 per cent. of bulls will perform satisfactorily on cows not in heat. A minimum quantity of sterile white vaseline should be used for lubricating the artificial vagina to avoid contamination of the semen sample with oily globules. Since the margin of temperature variation is as little as two degrees, the only method of assessing the temperature of the artificial vagina is by a thermometer. Finger tests can be misleading, especially on cold mornings, or in draughty farmyards. Occasionally a bull will not ejaculate with the artificial vagina at a temperature of 42·5 C. (108·5° F.) but will perform perfectly at 45° C. (113° F.). Above this temperature, scalding of the penis may occur.

As a rule, two ejaculates should be collected within a short interval although in special cases or where much variation exists between ejaculates, three will give greater satisfaction. Since one advocates the avoidance of excessive use of the bull it seems to be inconsistent to take three or more ejaculates in quick succession, although in many cases little harm will result. At the time of collection into the artificial vagina it is essential to note and classify the keenness to serve (Haq, 1948), the type of erection, mode of onset, and method of protrusion of the penis. Abnormally the erection apparently may commence from the posterior part of the penis and spread slowly towards the glans; or the penis may even curve out of the prepuce in a semi-erect state and remain hanging out for some seconds after the bull has dismounted. The type of copulatory movements is worth noting since a proportion of bulls will show many short thrusts with the penis before ejaculation. The degree of thrust at ejaculation should be noted, and in general my investigations tend to show that the degree of thrust is proportional to the density of the semen.

The assessment of whether the ejaculates obtained are typical of normal production requires great care, and if any doubt exists, a second examination seven to ten days later should always be carried out. Whether the veterinary surgeon is performing general semen tests himself, or sending samples to a laboratory, the volume, colour and type (creamy, milky or watery) of semen must be noted.

Semen from a healthy bull should be milky-white or yellow-white in colour and of milky or creamy consistency. Occasional bulls produce yellow coloured semen due to pigments arising from the seminal vesicles, but knowledge on this is lacking. An admixture of epithelial cells and tissue debris leads to a grey colour of the sample. In my experience, coloration attributable to blood in the semen is rare. The consistency of semen is decreased when the density of sperm falls, which may also occur in bilateral occlusion of the ducts. The consistency increases when the sperm numbers are high, becoming creamy when the density is above 1,000,000 per cu. mm. When many leucocytes are present, as in acute seminal vesiculitis or epididymitis, the consistency is very thick and the samples may not move on tilting the tube.

The *p*H can be determined adequately in the field, with a B.D.H. brom-thymol-blue capillator. With this apparatus most fertile semen shows a range of *p*H 6·0 to 6·4. A high *p*H (alkaline) denotes subnormal fertility. The apparatus is of great use in determining if watery samples obtained after an unsatisfactory collection are true ejaculates or accessory secretions. The latter give a *p*H reading of 7·0 or above; while a true ejaculate containing few sperm or cells, will give a reading in the region of *p*H 6·8. If perchance soap has been used to lubricate the artificial vagina, and has con-

taminated the sample, a very high *p*H, probably over 8·0, will be shown. The initial motility of the semen should be noted after warming the slide over a spirit lamp or cigarette lighter; care should be taken that excessive heat is not applied, by testing on the back of the hand. For storage either to take back to the surgery, or for transference to a laboratory, cold shock to the samples can be avoided by wrapping the tubes first in cotton wool about ½ in. thick and then in two layers of greaseproof paper, or four layers of newspaper, and placing directly into chipped ice. This method ensures a gradual temperature fall to between 4° to 8° C., where it will remain constant for 36 to 48 hours, after which time fresh ice will be needed. Semen transferred to small clean tubes and packed as indicated in a tin with ice will travel at least 100 miles through the post and arrive in good condition for examination. Unless some indication of the initial characters is given together with the history, adequate diagnosis is not possible.

I do not intend to cover details of methods of laboratory examination, but would recommend that a small portion of each sample be diluted with normal saline, preferably in a standard dilution, of which 1 : 100 is very suitable for abnormal semen, and examined with a cover slip on under the ⅙ in. objective. This will indicate at once any gross sperm abnormality, such as loose heads, or knobbed sperm, when a decision can be given at once. The numbers of sperm differing from the normal can be estimated.

Diagnosis of the Case

As has been indicated, many factors contribute to accurate diagnosis.

(*a*) Testicular hypoplasia, frequently associated with epidymal under-development, is seen in young bulls. Such bulls are very keen, erect normally, but the thrust is poor. Semen is of very low density. Sperm are rare (although they may number up to 250,000 per cu. mm.) (Lagerlof). Motility is very poor or non-existent. Low temperature viability time is short. *p*H 6·6 to 6·8. The semen shows many abnormal forms, especially loose heads, and abnormalities of the middle piece. Testicular cells are not usually present, and boat-shaped cells are never found.

(*b*) In testicular degeneration, the sperm production is reduced due to some adverse effect on the germinal epithelium. This results in either low density or poor sperm reserves. In fertile animals, the second ejaculation averages about 96 per cent. of the density of the first, and the third ejaculate about 54% of the first Rollinson (1950); Davis & Williams (1939); Haq (1948). These differences tend to become more marked in abnormal bulls, so that in a series of sterile animals examined the second ejaculate was only 46 per cent. density of the first, and the third 38 per cent. In young bulls that have been excessively used, frequently the second ejaculate is very markedly lower in density, whereas the other semen characters are not affected. The *p*H is normal to high, 6·2 to 6·8, and may increase with successive ejaculates (Anderson, 1941). Increased numbers of abnormal sperm are present (heads 4 per cent., middle piece 10 per cent., tails 6 per cent., are the normal limits). Fertile semen may contain any single type of abnormality in very small numbers and in infertile semen the incidence is greatly increased, so that 5 to 10 per cent. of any single type of abnormality will reduce fertility.

Abnormality of the middle piece interferes with fertility by reducing motility. Such sperms may, if present in large numbers, cause sterility. Swollen and thickened middle pieces are most serious.

In degeneration increased numbers of boat-shaped cells, spermatids, and less commonly, spermatocytes and giant cells may be seen (Haq, 1948). The medusa formations of Blom (1947) when related to sperm numbers, also indicate severe testicular changes and in extreme atrophy may number more than the sperm per unit volume.

Clinical Examination

Considering its ready accessibility, it is remarkable how few can palpate the scrotum accurately. Palpation of the scrotum aims at determining the size of the testicles, their freedom to move within the tunics, and their consistency. Subnormal size of the testicles may indicate under-development, hypoplasia or late stages of fibrosis (Figs. 1 to 5), while a super-normal size may be due to orchitis, hydrocele, or thickening caused by mechanical injuries. Assessment of the presence of adhesion is probably the most difficult part of the clinical examination. A change in consistency may be localised to small areas of the testicle, so that care must be taken to examine each part of the surface. The healthy testicle is best described as turgid in consistency (ripe tomato). In severe degeneration, the consistency of the testicle is decreased, and soft testicles produce semen of low density, with a varied proportion of abnormalities of the sperm head.

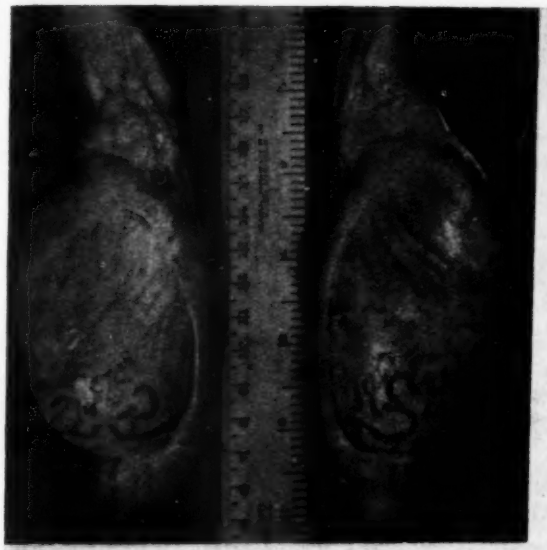
The head (caput) and tail (cauda) of the epididymis can be palpated easily, but the body may not be palpable in all bulls. Degree of development, consistency, and the presence of acute or chronic inflammation can be detected. The epididymis may be aplastic, or poorly developed, as in hypoplasia (Barron & Haq, 1948).

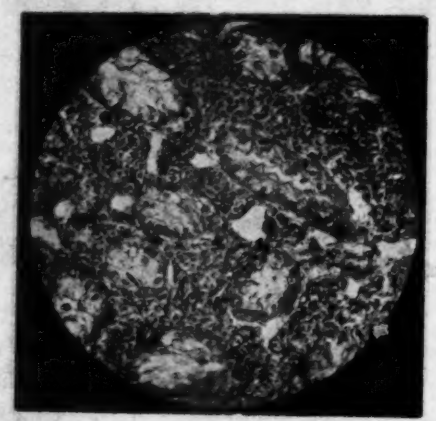
The neck of the scrotum can now be palpated for the general conformation and the presence of fat deposits, which later will upset the thermo-regulatory function of the scrotum. A short spermatic cord may be associated with hypoplasia while an excessively long cord will predispose to testicular degeneration.

It will be very easy to miss bulls that have been operated upon for inability to protrude the penis. In the very small number that I have seen, the site of operation is virtually not detectable. However, in a proportion of bulls so operated upon, the posterior curvature of the sigmoid of the penis falls from its normal position just posterior to the neck of the scrotum, forward, until it becomes anterior to the scrotum.

Rectal palpation in the bull, while requiring some practice, is not difficult. Immediately in the mid-line is felt the muscular wall of the pelvic part of the uro-genital canal, and on palpation muscular contractions frequently ensue (urethral and bulbo cavernosus muscle). The bulbo urethral glands are not palpable. On following the muscular uro-genital canal forward into the pelvis, a transverse prominence is easily recognisable at the anterior end. This ridge is formed by the dorsal part of the body of the prostate gland. Anterior to the prostate, the seminal vesicles commence, and diverge slightly to either side. They are characteristically knobbly and lobate; they may vary in degree of development, amount of lobation, consistency, or in acute inflammation they may show tenderness on pressure. In adult bulls the seminal vesicles may measure up to 6 in. long and 1¼ in. in width, and in general, the older the bull the larger and firmer are the seminal vesicles. There is, however, much variation and lack of use will cause the glands to be tense, due to conservation of secretion (Christiansen & Blom, 1947).

Lying between the seminal vesicles, side by side, can be felt the ampullae of the *ductus deferens*. In size, each resembles a fountain pen, being about 1 to 1·5 cm. in diameter, and they commence side by side and diverge posteriorly, suddenly narrowing after about 10 cm. into the respective *vasa deferentia*. Palpation is not always easy, since Christiansen & Blom (1947) have shown that not in all cases are the ampullae dorsal to the urethra. However, passing the fingers





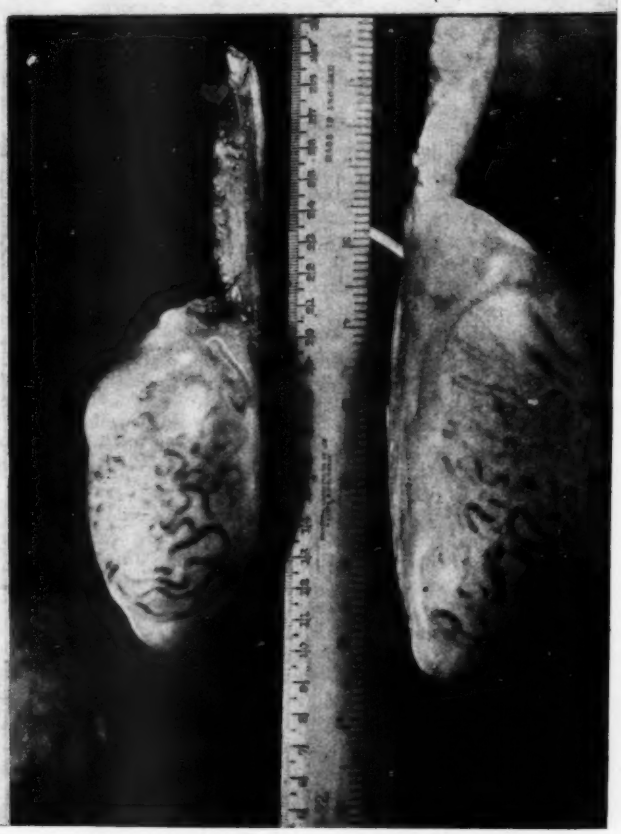


Fig. 1 (top left).—Testicles, atrophy and fibrosis. × ½. Ayrshire bull, 2 years 4 months.

Fig. 2 (centre left).—Testicles, atrophy, general view. × 100.

Fig. 5 (bottom left).—Hypoplastic testicles, general view. × 100.

Fig. 3 (top right).— Atrophic testicle, tubules. × 250.

Fig. 4 (bottom right).—Testicles, Hypoplasia. × ½.

back and forwards, transversely in the space between the seminal vesicles, usually will locate the ampullae.

Concluding the clinical examination, when defects of mounting and erection have been noted the bull should be walked or trotted so that the hind leg and back action may be observed. Mechanical injuries, not always noticed by the herdsman, may give prominent symptoms under these conditions and might otherwise pass unheeded.

Prognosis

In considering the future of abnormal animals the opinions of experienced workers in this field are of great interest. In Sweden, for example, it appears that judging of bulls has tended to favour pure-bred types which have predominantly feminine characters; in other words, bulls with weak secondary sexual characters and docile tempers. This, according to Lagerlof (1948) is a predisposing cause of sexual weakness, and prolonging the sexual life of such animals by hormone treatment is a short-sighted policy.

Management factors have been shown to have an important bearing on bull fertility (Bartlett & Perry, 1939; Haq, 1949) and it soon becomes obvious that while some bulls will resist all sorts of bad housing and feeding, others soon succumb to environmental defects.

In all cases of developmental abnormality, aplasia or hypoplasia of parts of the reproductive tract, of abnormal sperm types in the Guernsey and Friesian, no practical use can be served by prolonging the animal's life. Similarly in trichomoniasis, brucellosis, and *C. pyogenes* infection of the epididymis, the prognosis is bad. Abscess formation in the epididymis results in so much reaction and fibrosis, apart from any degenerative changes of the testicle due to the heat of inflammation, that slaughter should be recommended.

The types of case possibly amenable to treatment are those of early or moderate testicular degeneration. In these cases reduced usage or sexual rest is the first essential. If the management is bad this should if possible be amended. Hotchkiss (1944) contends that foreign hormone preparations being of a protein (serum) nature stimulate the production of antibodies, so that response to treatment will become less marked with repetition. Similarly the effects of hormone preparations given by injection are short lived, so that treatment by this method can at best boost semen production and the changed management and less frequent use must be relied on for prolonged effects. In old animals and in those with advanced degeneration in which the testicles may not respond, hormone treatment is useless. Injection of P.M.S. (six doses of 1,500 units) frequently gives a moderate improvement in semen characters and fertility rate in middle-aged bulls (three to six years). The density may rise quite markedly (40 per cent.) and the number of testicular cells shed is reduced (Haq, 1949). However, the percentage of abnormal sperm does not vary with this dosage. Frequently a most marked increase in libido is observed, but this is not seen in every case. Unfortunately, my data on luteinising hormone is very scanty and insufficient to assess the true value in the bull.

Ascorbic acid has been tried with poor results and we have discontinued its use. Dosing requires to be very frequent and again the effects tend to be short lived.

In conclusion, I hope that you now have a more accurate idea of the position of the abnormal bull in this country. No country can be free from such troubles, and the sooner they can be recognised the quicker they will be controlled. I have endeavoured to demonstrate the degree and type of abnormality that can be found in this area, using very simple methods. In this field the veterinarian can make a big contribution to the welfare of farming, the profession and to zoology.

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General Discussion

A lively discussion followed the paper, and some of the more important points are recorded. Mr. D. L. Stewart enquired as to the proportion of bulls in which clinical abnormality could be detected. Cryptorchism was discussed at some length, Mr. J. W. H. Holmes enquiring the position in the bull in regard to possible hereditary influence. Professor Formston stated that the testicles were present in the scrotum of all male animals at birth, and gave his observation on the incidence of abdominal testicles in young calves, obtained by examination of slaughterhouse specimens. They were much more frequent than commonly is supposed. Dr. A. C. Fraser recalled that he could not remember a cryptorchid calf encountered among several thousand presented for castration. Mr. G. P. Male quoted instances of cryptorchism in the horse.

Inability to serve due to temperament in the bull was also discussed, Mr. G. P. Male instancing several cases, and the ultimate legal recognition of the bull's temperament. He also quoted an instance where an abnormally large brisket on a bull prevented service.

Mr. A. W. Smith agreed that pigmented semen was seen more frequently in bulls of the Friesian breed, and said that he had encountered a familial relationship. Professor Burrow enquired as to the recommended age for a bull before being used for service, and whether the first service given by a bull was always sterile. He also wondered how long a period should elapse before a valuable bull finally should be condemned as sterile.

In reply, Dr. Rollinson said that clinical abnormality was detected in the proportions given of bulls suffering from hypoplasia and atrophy, and in five out of six cases with acute or chronic infections. This amounted to 22 per cent. Figures were not available separately for softness of the testicles. There was no evidence available of inheritance of cryptorchism in the bull; there was, however, proof in other animals, *e.g.*, the goat. Since such bulls were abnormal and might be sterile, due either to hypoplasia or

(*Concluded at foot of next column*)

CLINICAL COMMUNICATIONS

MASTITIS IN A BULL

P. CROSFIELD, M.A., M.R.C.V.S.

CHIPPING NORTON

Subject.—Pedigree Friesian bull, 14 months.

History.—Noticed by owner to be moving stiffly; examination showed a swelling in front of the scrotum. One of the vestigial teats was much enlarged, hot and painful, and a lump could be palpated in size and character much like that in the quarter of a young maiden heifer with a *C. pyogenes* mastitis. It was possible to withdraw 1 or 2 c.c. of a thick blood-tinged secretion (for whose examination I am indebted to the Ministry of Agriculture Laboratory, Reading) yielding numbers of *Str. agalactiae*.

Treatment.—Penicillin-in-oil 3×10^4 U intramuscularly on successive days, coupled with fomentation and stripping, gave quick resolution.

There does not seem any reason to fear an orchitis with subsequent sterility.

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TOXIC REACTIONS FOLLOWING THE USE OF PHENAMIDINE (MAY & BAKER) IN THE DOG *

I. BY SIDNEY S. NYE, M.R.C.V.S.,

ROMFORD

Subjects.—Four Dachshund puppies, three to four months, ten to 15 lb. bodyweight, all in excellent order, except for slight touches of demodectic mange.

Treatment.—2 to 2½ c.c. (½ c.c. over recommended dose) given at five-day intervals (one day longer than recommended) for five injections (two to six recommended).

Observations.—All four puppies, unrelated, died within ten days of each other and showed the same symptoms. They began losing weight after the third injection and 17 days after the fifth injection showed slight sickness for a few days, becoming more frequent, then bringing up blood for the last 36 hours. No jaundice was noticed in any case, and death occurred 21 days after the final phenamidine injection.

Anthisan was used in conjunction with the phenamidine in two of the above cases.

Post-mortem examination revealed only a yellow, very fatty, degenerated liver, while on histological examination there was advanced cloudy swelling of the hepatic cells with early but widespread fatty degeneration.

Remarks.—Phenamidine is a drug recently issued to the profession and, although slightly overdosed, no puppy received more than the maximum recommended for the duration of treatment.

These are the first fatalities that I have been able to connect with the use of phenamidine, but I am wondering if permanent liver damage is not caused by, say, three injections and whether May & Baker's suggestion that glucose fed during the course of injections would itself be sufficient to prevent some slight degeneration.

The mange was cured in all cases.

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II. BY H. A. CRAWSHAW, F.R.C.V.S.,

AND J. NICOL, M.R.C.V.S.

The product phenamidine, stated by the makers to be the di-esethionate of 4 : 4′-diamidinodiphenylether, has been recommended for the treatment of demodectic mange in the dog. The suggested dose is 0·30 c.c. of the 5 per cent. solution for each kgm. bodyweight.

The drug has been tried in this practice, but several animals have shown toxic symptoms following its use. One dog had to be destroyed shortly after its administration (Case 1), while a second died after a prolonged illness (Case 2), and it is felt that the symptoms in both cases must be attributed to the use of phenamidine. This note is published, therefore, to call attention to its possible danger and in the hope that other practitioners may publish their experiences with it.

CASE 1

A five months old Dachshund puppy, weighing approximately 10 lb. 1 c.c. of 5 per cent. phenamidine was injected subcutaneously. Within 20 minutes the animal showed symptoms of anaphylactic shock, with collapse, oedematous swellings round the eyes and accelerated respirations. Adrenalin 1 c.c. was administered within 10 minutes of the appearance of symptoms, and these gradually subsided, but vomition occurred about 30 minutes later and continued at intervals throughout the day. During the following day sickness was very frequent and abdominal pain was marked. This increased during the next day and palpation of the abdomen revealed the presence of an abnormal enlargement. An exploratory laparotomy was performed, revealing gross liver enlargement. After complete recovery from the anaesthetic the animal continued to show abdominal pain and was destroyed the following morning.

CASE 2

A pedigree Shetland Sheepdog bitch, about 12 months old, weighing 15 lb., Demodex were demonstrated from a small patch on the head; 2 c.c. of 5 per cent. phenamidine were given without apparent ill-effect, and this was repeated a week later. The appetite became capricious and the owner reported the occurrence of intermittent diarrhoea, which later became severe, and that vomition was frequent. Loss of condition became so marked that within a month of the first injection the animal weighed only 12 lb. Later in the illness the temperature rose to 106° F. and penicillin was administered, and this appeared to control it. The membranes became cyanosed and anaemic. 100 c.c. of blood were transfused and protein hydrolysate was given intra-peritoneally and *per os*. Glucose saline was frequently injected subcutaneously and as much glucose as possible was given by the mouth. Vomiting, which had ceased for a time, recommenced, and the animal died about six weeks after the initial injection.

Post-mortem examination revealed advanced fatty de-

* It should be noted that the following communications relate to the use of phenamidine only in repeated and high dosage for the treatment of a chronic condition; we would not wish readers to be prejudiced against its employment in its accepted sphere, viz., that of the treatment of canine babesiosis, in which dosage is given over a limited period and in which cases the value of the drug already is well established.

It should also be added that we are informed that a number of practitioners report the use of phenamidine in demodectic mange in adult dogs without ill effects and with good results.

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too late descent of the testicle, slaughter was to be recommended.

The most suitable age at first service for a bull was 18 months, but the speaker had no knowledge concerning the sterility of the first service in the bull's life. In considering the future of a valuable animal, if no improvement in the semen quality had occurred in three months, then slaughter could be recommended easily.

generation of the liver, while the pylorus and a small length of the duodenum were invaginated into the stomach, due, no doubt, to the severe retching before death.

CASE 3

A Shetland Sheepdog, weighing 16 lb., was given 2 c.c. of 5 per cent. phenamidine, and a week later was reported to be listless and off its food. In view of the experience in Case 2, injections were discontinued and the animal showed no further symptoms.

CASE 4

An eight-month-old Boxer bitch, weighing approximately 50 lb., was diagnosed microscopically as suffering from demodectic mange and was given 2 c.c. of 5 per cent. phenamidine. An under-dose was given in view of the toxic symptoms in previous cases. This was repeated a week later and within half an hour symptoms of anaphylactic shock with distressed breathing, collapse and swelling of the face and legs appeared. Phenergan (M. & B.), 2½ c.c., was given subcutaneously, and symptoms largely abated within a few hours. No further injections of phenamidine were given and the animal suffered no other ill effects.

DISCUSSION

In our experience the toxic symptoms associated with the administration of phenamidine may be manifested in two ways:—(*a*) An acute anaphylactic response seen shortly after the injection of the drug, especially when the animal has been sensitised by a previous injection; or (*b*) a prolonged poisoning effect, probably due chiefly to damage to the liver cells. In Case 1 the anaphylactic reaction was manifest, following the initial injection of the drug.

SUMMARY

Four cases are described in which poisoning by the subcutaneous administration of phenamidine is suspected, with resulting loss of two of the dogs.

ABSTRACTS

[Nutritional Abortion and Stillbirths in Victorian (N.S.W.) Pigs. PULLAR, E. M. (1950.) *Austral. vet. J.* Jan. 4–8.]

The literature is reviewed, showing that there is a higher incidence of stillborn pigs in very large and very small litters than in those numbering between four and 12 young, that the proportion of stillborn pigs rises with the increasing age of the sow, that a deficiency of vitamin A or iron may cause all the pigs to be born dead and that a calcium deficiency may lead to as many as 50 per cent. being stillborn, but that a protein or a vitamin E deficiency has little effect.

The history of the ten outbreaks investigated during the period from 1930 to 1945 was usually that of abortion at or near full term with the foetuses free from any gross abnormality. There was no evidence of sterility or vaginal discharge, and all the sows appeared perfectly normal. No positive reactions to brucellosis were found. The herds were scattered over a considerable area and there was no evidence of any common regional factor. It was impossible to determine the seasonal incidence accurately. There was no common dietary factor, but all the diets were deficient in minerals (particularly calcium), protein and fresh green food.

The treatment consisted of adding to the diet 5 to 10 per cent. of meat meal, and a lime-salt mineral mixture, and either providing adequate grazing or giving cod-liver oil. As far as could be determined, the trouble ceased in every herd immediately the diet was corrected.

It was assumed that the phenomenon was due to the cumulative effect of a number of factors acting by exaggerating the normal process of foetal atrophy.

J. O. L. K.

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[The Possibility of Artificial Pregnancy in Cattle. HAMMOND, J. (1950.) *J. Min. Agric.* **57.** 67–70.]

Ova transplant experiments have been successful in the rabbit and in a few instances in sheep and goats, normal young being born and reared. So far, however, while fertilised ova have been obtained from cows and transplanted into recipient cows, no full-term calf has been born. Various problems concerning the technique for superovulating donor cows, and for the collection and transplanting of the ova, are discussed briefly. The possible applications of this technique, if it be perfected, in the cattle industry are mentioned.

A. T. C.

REVIEW

[Elephant Bill. By Lt.-Col. J. H. WILLIAMSON, O.B.E. (Book Society Non-Fiction choice.) (1950.) Published by Rupert Hart-Davis, Ltd., 18s.]

The veterinarian presumes to take an interest in all animals and, though he may not realise it, thereby binds himself to a furtherance of the welfare, amongst other things, of fishes and worms. At the other end of the scale of magnitude we have the bison and the elephant. The latter in particular has attracted the attention of not a few veterinarians, who readily will admit that our knowledge of this animal has been greatly enlarged by persons outside the profession.

Elephant Bill, himself a victim to the spell of this jungle animal, after which he has been so fondly named, adds substantially to our knowledge in his delightful book and succeeds admirably, and one feels quite unconsciously, in conveying to his readers his own love of this remarkable beast.

There is much of technical interest relating to the breeding, feeding and working habits of the elephant; also of jungle lore, which gives a true background to this noble and intelligent animal. From his early years in Burma the author traces a picture of conditions as they existed, right through to the end of the Japanese war. In the tasks which he can perform the elephant shows himself to be a rival to the bull-dozer in every respect and under the right care and direction contributed much to our war effort in that rugged country.

There is no story here unless an account of events in chronological order constitutes one. But even so, the next page holds the mystery of animal or jungle which makes one ever eager to read on. This book is a real delight to read and as a means of relaxation is to be thoroughly recommended.

FOOT-AND-MOUTH DISEASE IN MEXICO

By the end of February, 1950, a total of 48,078,825 cattle in Mexico had been vaccinated against foot-and-mouth disease. All vaccine used during 1949 was manufactured in Mexico by the Joint Mexican-United States Commission for the Eradication of Foot-and-Mouth Disease. During 1949, over 8,000 infected or exposed animals were slaughtered—7,329 of these during the first six months. In the first two months of 1950, only 15 animals were slaughtered. In view of these encouraging developments, the commission plans to discontinue mass vaccination soon and to concentrate on repeated herd inspection. Meanwhile, the fight for complete eradication continues.—*N. Amer. Vet.*

REPORT

[Cyprus: Annual Report of the Chief Veterinary Officer for 1949 and of the Livestock Officer.]

In common with many other countries Cyprus has been experiencing difficulty in keeping the staff of its veterinary service up to strength. For example, a vacancy occurred in the post of Veterinary Research Officer in August, 1948, and it was not until December, 1949, that an officer was available. Similarly, the post of Livestock Officer was vacant for nearly two years. In spite of the difficulties some quite remarkable achievements are recorded. Anthrax, which formerly was a common disease in animals and in man and caused an annual loss of between £25,000 and £30,000, has now been practically eradicated by mass inoculation with a spore vaccine prepared locally from a South African avirulent strain; in all, 547,209 were vaccinated during the year. No cases of the disease were reported in animals during the year and only one case in man.

Another noteworthy achievement has been the total eradication of the cattle warble fly. Other diseases formerly endemic in the island which have been eradicated during the past 20 years are bovine tuberculosis, contagious abortion, sheep pox and goat pox. Blue tongue in sheep, too, has been brought under control; over 18,000 sheep in the infected areas were vaccinated and only three mild outbreaks occurred. The vaccine used was a chick embryo attenuated vaccine prepared at the Onderstepoort Laboratory, South Africa, from a strain of the virus isolated in Cyprus.

Newcastle disease was recorded for the first time in Cyprus and mortality in infected flocks was high. It was dealt with by quarantine measures and the use of Komarov's vaccine obtained from Israel; 270,198 birds in 117 infected villages were vaccinated.

In addition to the control of disease the veterinary service supervises the work of meat inspection and is in charge of licensing of cowsheds and dairies and the licensing of stallions.

Included in the staff of the Chief Veterinary Officer is the Livestock Officer. This post is now filled by an officer seconded from the Agricultural Advisory Service of Great Britain; he assumed duty in June, 1949. In his report he describes the work done at the Government Stock Farm, Athalassa, and at the various stud stations throughout the island. It is of interest to note that ewes are milked and their yield recorded; the high butter fat content of ewes' milk is indicated by the average of 8·6 per cent. shown by 71 ewes. A small flock of Sarda sheep, reputed to be good milkers, was imported from Sardinia. The work of the Poultry Officer is also described.

M. C.

The U.S.A. Department of Agriculture has recommended an increase of at least 37 per cent. in the number of sheep in America to meet expanding wool needs. Stressing the American dependence on overseas wool supplies, the Department said the United States had the land and forage resources to support a sheep population of 37,000,000 compared with the present 27,000,000.

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WEEKLY WISDOM

Quite often cases of cruelty arise from ignorance of husbandry, or sheer thoughtlessness, but so far as farming is concerned, kindness is but commonsense.—The Home Farmer.

Veterinary Surgeons Act, 1948

R.C.V.S. DISCIPLINARY COMMITTEE

The Disciplinary Committee of the Royal College of Veterinary Surgeons under the Veterinary Surgeons Act, 1948, considered three cases at its meeting on Wednesday, June 14th, 1950.

At the first, Mr. T. G. G. Herbert, of Kingsway, Aberaeron, Cards., appeared before the Committee with reference to two convictions. Firstly, that he was on November 7th, 1949, convicted at Aberaeron Magistrates' Court of driving a motor-car on a road whilst under the influence of drink to such an extent as to be incapable of having proper control of the vehicle on October 18th, 1949, Road Traffic Act, 1930, Section 15, and was sentenced to pay a fine of £10 and to pay £5 9s. 6d. costs, and his driving licence was suspended for 12 months. Secondly, that he was on December 19th, 1949, at Glamorgan Assizes convicted of common assault and was conditionally discharged for 12 months and ordered to pay £50 towards the costs of the prosecution.

Mr. Herbert was represented by Mr. Peter J. M. Thomas, Barrister-at-Law.

The Committee found the convictions proved, but did not take any action thereon other than to warn Mr. Herbert as to his future conduct.

The second case was that of Lieut.-Col. W. S. Codrington, of Bilton Lodge, Bilton Hill, Rugby, who appeared before the Committee on the following complaint:—

> "That, contrary to By-law 53 of the Royal College of Veterinary Surgeons, you, as a member of the said College, advertised or caused or permitted other persons to advertise for you by editorial or other notice in the public Press through the *Sunday Mercury* newspaper for January 8th, 1950, printed and published by the Birmingham Gazette, Ltd., at Corporation Street, Birmingham"
> and that consequently, it is alleged, you have been guilty of conduct disgraceful in a professional respect within the meaning of Section 6 of the Veterinary Surgeons Act, 1881."

The complaint was presented by Mr. R. V. Thatcher, Solicitor for the Royal College. Col. Codrington was represented by Mr. Grahame Swannick, Barrister-at-Law.

The Committee found the complaint proved and directed that during the period of six months from August 1st, 1950, to January 31st, 1951, the registration of the name of William Stephen Codrington in the Register of Veterinary Surgeons shall not have effect. The Chairman, Mr. Howard Dawes, C.B.E., explained that the effect of this was that Colonel Codrington was suspended from the practice of veterinary surgery during that period.

(It should be noted that this is the first exercise of the power of suspension from practice which was granted to the Disciplinary Committee under the 1948 Act.)

The last case was a complaint lodged by Mr. J. F. D. Tutt, of "Rothiemurchus," St. Cross, Winchester, against Capt. Z. B. Rutherford, O.B.E., of Tanglewood, Fordingbridge, Hants.

The complaint was as follows:—

> "That you, on or about July 24th,, 1949, being called in to see a sick animal or sick animals which were or had recently been in the care of another practitioner, did not inform the practitioner whom you were superceding nor caused the said practitioner to be informed by the person who called you in that his services were no longer required. The said practitioner being Mr. J. F. D. Tutt, of Winchester, and the said animals being the property of Mr. Walter Hutchinson"
> and that consequently, it is alleged, you have been guilty of conduct disgraceful in a professional respect within the meaning of Section 6 of the Veterinary Surgeons Act, 1881."

Mr. Tutt was represented by Mr. Brodrick, Barrister-at-Law, and Captain Rutherford was represented by Mr. Dingle Foot, M.P., Barrister-at-Law.

The Committee found that the complaint was not proved to its satisfaction.

NOTES AND NEWS

Diary of Events

Sept. 15th.—Meeting of the Southern Counties Division, N.V.M.A., at Southampton (Polygon Hotel), 6 p.m.

Sept. 22nd.—Meeting of the Biochemical Society in the University of Liverpool (Derby Hall, N. Mossley Road), 11 a.m. The meeting will take the form of a symposium on "The Biochemistry of Fish."

Sept. 22nd.—Meeting of the North Wales Division, N.V.M.A., at Bettws-y-Coed (Bryn Mawr Chapel School Room), 2 p.m.

Sept. 27th.—Meeting of the Editorial Committee, N.V.M.A., 1.30 p.m., to be followed by Meeting of the Executive.

Sept. 28th.—Summer Meeting of the East Midlands Division, N.V.M.A., at Thurgarton, Notts. (See Notice.)

Oct. 13th.—General Meeting of the South Wales Division, N.V.M.A., at Carmarthen. (See Notice.)

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THE N.V.M.A. AT CARDIFF

When Mr. J. H. M. Hughes, the Hon. Local Secretary of the Provisional Committee, and his colleagues contributed to our issue of July 15th an article on Cardiff and its environs, they must have dispelled most effectively from the minds of those members unfamiliar with the city the misconception of this year's place of meeting as the grimy, uninviting gateway to industrial Wales. As any such who foregathered here over last week-end for the Congress speedily confirmed for themselves, Cardiff is indeed an imposing capital, rich both in antiquarian and modern features of interest and impressiveness, and possessing, above all, the finest civic centre in the kingdom.

External circumstances may have been less propitious than those which accompanied the Association's two previous visits to the Principality—in 1911 when, as some yet may remember, the "National" met at Caernarvon under the presidency of T. Salusbury Price, and again in 1933 when Llandudno was the venue at the end of the three-year reign of Colonel P. J. Simpson—but at least we assembled with a welcome sense of temporary escape from the gloomy preoccupations and utterances of Whitehall. Moreover, it is surely wholly right that, whatever the political weather, the Association should, if it be a patriotic possibility, gather in grateful recognition of the successful completion of another year's progressive endeavour and gain strength and confidence for future effort from a brief indulgence in appropriate ceremonial, scientific discourse and social enjoyment.

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In the last connection it was a great pleasure to all members and their ladies to be the guests of the South Wales Veterinary Association at the traditional eve of Congress "At Home" and to savour both their wholehearted welcome and their generous hospitality at this function in the Park Hotel on Sunday last when members of the Welsh National Operatic Company gave a finely rendered concert programme. The opportunity of meeting the President, Mr. R. W. Hall, of Barry, and his lady was a reminder to many of the interesting history attaching to the achievement of this society in qualifying so soon and so fully for the status of host of the parent body for the present conference. They recall him as a leading member of the former Mid-West and South Wales Division, and it is high testimony to the virility of corporate veterinary life in the West Country that when, in 1934, the South Wales group decided to form its own division, and the Mid-West fraternity retired to their own perhaps more appropriate side of the Bristol Channel, both sections progressed from strength to strength; one day, indeed, we may find ourselves at Weston-super-Mare.

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As we are under the necessity of publishing early in the week, we can do little more, in addition, than convey the assurance that all goes well, beyond summarising the main features of the opening day. This is the occasion which provides the first public evidence of the cumulative process by which the civic authorities of the municipality concerned place the Association greatly in their debt. At 10.30 on the Monday morning, in the Assembly Hall of Cardiff Technical College, where the scientific sessions are being held, the members, delegates and ladies were warmly welcomed by the Lord Mayor, Alderman George Williams, C.B.E., J.P., on behalf of the city and its council, the President, Mr. J. W. Bruford, voicing the gratitude of the N.V.M.A. A move was then made to the adjacent rooms housing the exhibition of drugs, instruments and appliances, where the President commended the admirable display to the attention of all concerned. Then came the initial phase of the discussions on the previously circulated papers to Congress, seven in number. The first paper, by Mr. S. L. Hignett, of the Wellcome Veterinary Research Station, Frant, dealt with the topical subject "Factors influencing herd fertility in cattle," the time-curtailed discussion on which, doubtless in view of its importance, was accorded the dignity of three openers in Mr. D. W. Deas, of Lanswade, Mr. J. Smith, of Carmarthen, and Mr. H. W. Steele-Bodger, of Tamworth. Unfortunately, Mr. Deas was absent through illness, and time did not allow of his contribution being read, but it will be published in the report of these proceedings which will appear in our Congress Number.

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Whitchurch Mental Hospital Farm presented an animated scene in the afternoon, when the first series of an excellently staged programme of demonstrations was carried out. The "good old days" of veterinary practice, which yet have more than a merely sentimental carry-over to the present, were recalled refreshingly by the practical contribution on soundness given by Brigadier E. S. W. Peatt, of Ashford. Anaesthesia occupied the remainder of the afternoon's programme, two of the three items relating to the process in small animals; "general" by Mr. G. C. Knight, of the Royal Veterinary College, and Mr. C. R. Wood, of Wimbledon, and "epidural and regional" by Dr. J. S. A. Spreull, of Dundee. Recent contributions to this journal have formed a helpful prelude to the demonstration given by Mr. W. T. Harrow, of Imperial Chemical Industries, on general anaesthesia in cattle by the use of Anavenol with Kemithal. This programme of demonstrations, the first of two, created a lively interest and it was fortunate that a second showing had been arranged for the medical films on view at the Technical College during the course of the afternoon.

A busy opening day, full of compelling events, was brought to a memorable close by the civic reception at the City Hall. Here the deeply sincere welcome accorded the Association was renewed amid impressive surroundings in the hospitable fashion traditional to the City Fathers of Cardiff.

(To be continued)

Veterinary Partnerships

The N.V.M.A. has prepared a memorandum making suggestions in connection with the drafting of agreements between members of the profession proposing to enter into partnership. This memorandum, which covers the points which in fact should be dealt with in such an agreement, is drawn up under a number of main headings, with comments in each case, and can be obtained from the General Secretary upon request.

The memorandum can also be obtained with an attached copy of the N.V.M.A. specimen form of agreement covering the employment of an assistant.

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PERSONAL

Mr. James Anderson, of Keith, Honoured by Colleagues

Doyen of the veterinary profession in the North-East of Scotland, Mr. James Anderson, M.R.C.V.S., of Keith, was entertained recently on the occasion of his retirement, by his fellow-practitioners in the area lying between Fifeshire and Ross-shire, to a complimentary dinner in the Gordon Arms Hotel, Elgin, when Dr. Jamieson, veterinary investigation officer, Craibstone, presided over a company of over 20.

After an excellent meal, the toast of the veterinary profession was proposed by Councillor J. R. Macnab, Torr-Achilty, Elgin, and Mr. John Suttie, M.R.C.V.S., Forres, replied. In doing so, he gave a résumé of the progress that has been made in veterinary science, more especially during the past ten years.

The main toast of the evening, that of "Our Guest," was proposed by Mr. J. B. Russell, M.R.C.V.S., Elgin, who in the course of his remarks said: "During 40 years at Keith Mr. Anderson has carried on the traditions of his family to the full—hard work with absolute devotion to his calling—and has added lustre to the already lustrous name of Anderson."

Mr. G. Rutherford, M.R.C.V.S., Forres, joined with Mr. Russell in paying tribute to their guest. He referred to the many happy associations which he had had with Mr. Anderson and with his father before him.

In reply, Mr. Anderson said that the memory of this one evening at the culmination of over 40 years "in harness" was one which he would always cherish, for to enjoy the respect of his colleagues and those whom he had served was surely the greatest of all prizes.

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Births.—Downe.—On August 30th at Diss, Norfolk, to Nancy, wife of C. H. Downe, a son.

Taylor.—On August 6th, 1950, at Bridgend Hospital, to Jean, wife of P. E. Taylor, a brother for Gail—Richard William.

Wilmot-Smith.—On June 30th, 1950, to Patrick and Rosalys Wilmot-Smith, MS.R.C.V.S.—a son (Charles Patrick).

Wykes.—On Tuesday, August 29th, at Dunholme Lodge, Lincoln, to Mr. and Mrs. David Wykes (Nancy Donald, M.R.C.V.S.), a daughter.

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Marriage.—Appleby—Newitt.—The marriage took place on Saturday, August 5th, 1950, between E. Calvert Appleby, B.SC., M.R.C.V.S., son of the late R. C. Appleby, F.B.O.A., F.S.M.C., and Mrs. M. M. Appleby, of Enfield, Middlesex, and Josephine May Newitt, B.SC., elder daughter of Mr. and Mrs. A. C. Newitt, of Bebington, Cheshire.

Scurfield—Rackham.—On August 17th, 1950, at St. Helier Parish Church, Jersey, Robert W. Scurfield to Jennifer Anne Rackham, M.R.C.V.S. Members of the profession present were Mr. A. Messervy, M.R.C.V.S., and Miss R. Hughes, M.R.C.V.S.

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RESTORATION TO R.C.V.S. REGISTER

Mr. W. G. R. Oates, as Registrar under the Veterinary Surgeons Acts, 1881 to 1948, informs us that the name of James Patrick McEldowney, Moneyglass, Toome, Antrim, was restored to the Register of Veterinary Surgeons on August 30th, 1950.

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Lightning struck a tall elm tree at Prestwold, Leicestershire, killed six cows sheltering beneath and then travelled along a barbed wire fence to kill another cow 25 yards away.

ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Foot-and-Mouth Disease:

Bedfordshire.—Red House Farm, Bletsoe, Bedford; Harings Farm, Riseley, Bedford (Aug. 31st); Bletsoe Castle, Bletsoe, Bedford (Sept. 1st).

Swine Fever:

Cambridge.—Home Farm, East Road, Fen Ditton (Aug. 29th.).
Dorset.—11, Cynthia Road, Newtown, Parkstone, Dorset (Sept. 2nd).
Lancashire.—Edgewood Hall Farm, Edgewood Road, Orrell, Wigan; Reigate House, Lower Leigh Road, Westhoughton, Bolton (disease at: Booth's Piggeries, Leigh Road, Westhoughton, Bolton), Lancs. (Aug. 28th).
Lincoln (*Lindsey*).—Grange-de-Lings, Nettleham (Aug. 31st).
Lincoln (*Parts of Lindsey*).—41, Beresford Street, Lincoln (disease at: Cheeseman Piggeries, Skew Bridge, Lincoln (Aug. 28th).
Notts.—House of Sacred Mission, Kelham, Newark, Notts. (Aug. 29th).
Surrey.—Woodbury, College Road, Camberley (Sept. 1st).
Yorks (*W.R.*).—44 Main Street, Addingham, Ilkley (disease at: Back Lane Farm, Addingham (Aug. 29th); Yews Farm, Firbeck, Rotherham (Aug. 30th).
Yorks (*W.R.*).—156, Town Street, Bramley, Leeds (carcase at: Government S/House, No. 1, New York Street, Leeds); Harrison's Yard, Bramley, Leeds (Aug. 31st.).
Yorks (*N.R.*).—Rose Vale Farm, Scarborough, Yorks. (Aug. 28th).

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LEGAL NOTES

Sale of Veterinary Practices in France

In the July issue, 1950, of the *Recueil de Médecine Vétérinaire*, published by Corps Enseignant of the Alfort Veterinary School, there is an extremely interesting article, by A. Charton, on an important decision by the Court of Appeal of Poitiers in France.

The writer first points out that the strict law under the French Civil Code is that neither a veterinary practice nor a medical practice can be sold. However, it shows how the strictness of the law has been modified by the law enforcing personal covenant by the transferor of a practice that he will not practise in the area of his former practice for a certain period. This is in effect the English restrictive covenant, such as is entered into by a veterinarian on selling his practice in this country.

In the case before the Court of Appeal, a French veterinary surgeon sold the goodwill and stock in trade of his practice in March, 1943, to his successor and entered into a covenant with his successor that he would not practise directly or by means of an assistant during a period of ten years within a radius of 15 kilometres from his former place of practice. The transferor died in 1944, a year after he had entered into the restrictive covenant.

In 1947 his son, who had hitherto been a veterinary student, qualified and commenced practice in the place where his father had formerly practised, and had covenanted not to practise in for ten years. The veterinarian who had bought the goodwill from the deceased father brought an action against the son to prevent him commencing practice on the grounds that the contract entered into by the deceased father was binding on the son. The point was made that if it was not binding on the son, then the son would have the advantage not only of setting up practice in a place where has father was formerly well known but of gaining financially from the estate of his deceased father, a part of which estate was the money paid by the incoming veterinarian for the goodwill which he was now losing by the new opposition of the son.

The court, however, held that in law the contract was between the deceased veterinary surgeon and his immediate successor, the purchaser of the goodwill, and that the contract was personal. There was, therefore, no obligation in law on the son to prevent him commencing practice.

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WELSH CATTLE TOP THE MILLION

Cattle in Wales have passed the million mark for the first time, according to statistics supplied by the Welsh Department of the Ministry. In 1939 the total was 858,000; last year there were 985,000 and this year's record figure is 1,010,011. There were 29,040 registered milk producers in Wales in June 1949, and 10,728 cattle herds producing milk for sale; percentage of total cattle attested, 27·4; number of T.T. producers, 4,001; accredited producers, 2,581;

sale of milk off farms, October, 1948-September, 1949, 163,885,000 gallons.

At 3,864,000 the total of sheep and lambs is within 700,000 of the 1939 figure and compares with 3,642,000 last year. Pigs, at 115,000, are down by 17,000, but poultry are approaching 5½ millions. There are less than half the number of agricultural horses in Wales than there were in 1939.

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CAPTIVE ANIMALS

"The letters and news paragraphs about the Jerusalem Zoo which have been appearing in *The Times* lately," observes that newspaper in a leading article in its issue of August 18th, "have culminated, as such discussions almost always do, in the suggestion that zoological gardens are in themselves things undesirable. That view is certainly widely—or at least very vocally—held in this country. The chief secretary of the Royal Society for the Prevention of Cruelty to Animals argued the other day that the educational functions of a zoo could be adequately fulfilled in this country by the exhibits in natural history museums. This argument seems to assume that nothing is to be learnt from observing the behaviour of captive animals, and that a dead specimen is just as instructive as a living group of animals suitably exhibited. It entirely leaves out of consideration all that has been, and is being, discovered in zoos in many parts of the world about such things as animal behaviour, periods of gestation, internal parasites, and so forth. By way of example, the investigations recently carried out at Copenhagen into the question of how far the songs of birds are instinctive, and how far learned by the young bird from its parent, may be quoted.

"An English translation of a remarkable book, 'Wild Animals in Captivity,' by Dr. H. Hediger, Director of the Zoological Gardens, Basle, has recently appeared. The essence of the author's argument is an attempt to sum up what is known of the workings of the minds of animals, and to consider captivity in the light of that knowledge and not in the light of human feelings. To many excellent people captivity seems dreadful because it deprives an animal of its freedom to go where it chooses, over vast spaces. But all the evidence suggests that the idea of freedom does not exist for animals. Most of them, at least, move about for two reasons—to find their food and to escape from their enemies, of whom man is the chief. The animal needs a certain area to live in, a territory which, by many species, is methodically marked out and defended against all other competing animals. Territories of animals of non-competing species naturally overlap. The caged animal, so far as can be ascertained, does not try to escape to freedom, or to anything else. If it tries to escape, it is to get away from something—probably, in the untamed specimen, its arch-enemy man or something which it associates with man. The problem of the taming (which does not mean the domestication) of a wild animal is first to overcome its fear of man, so that it is not constantly trying to put a certain distance, which varies with the different species, between itself and its enemy. It must, in fact, be brought to regard man as its friend, and with some adult animals this is impossible. They live in a constant state of nervous tension, which may even kill them. An adult moose, for example, if it is captured, almost always dies of heart failure, though a moose captured when it is very young will thrive. Secondarily, the animal should be induced to regard its cage as its territory, in which it has proprietorial rights, in the same way that a dog regards its master's house at its own. Thus with suitable food supplied, with the sense of danger and the desire for flight eliminated, and with a sense of ownership of territory established, there is no reason to suppose that the captive animal is not perfectly contented in a comparatively small space. The proof of this is that many species will reproduce their kind in these conditions, and that they live far longer than in the wild.

"To say this is not to say that all is well with zoological gardens, even the most up to date of them, to-day. Few of them could face with equanimity, for more than a fraction of their animals, Dr. Hediger's 'only criterion for suitable biological conditions . . . success in breeding.' There are still far too many animals unsuitably kept, and the breeding of far too many has never even been attempted. Sentiment is not a useful guide, since the largest, or the most natural-seeming, cage or enclosure is not necessarily the most successful. Progress is being made, however, and the zoo, as an institution, has many valuable functions to perform. It can add greatly to zoological knowledge. It will, moreover, probably come to play an increasing part in preserving certain very rare animals from extermination. It has, lastly, still a very useful place in popular education, a function which will be all the more instructive when the public has learnt to consider the inhabitants of a zoological garden as animals and not as odd-looking human beings."

MASTITIS TREATMENT AND CHEESE MAKING

In an address at the 28th Educational Conference for Dairy Plant Operators and Milk Distributors, held at the University of Vermont and State Agricultural College, Burlington, October 19th-20th, 1949, Professor Alec Bradfield recommended that milk from cows treated with mastitis curatives be discarded by cheese-makers. According to an abstract of Professor Bradfield's address in *Canadian Journal of Comparative Medicine* (March, 1950), "if only a few cows in a herd were treated [with aureomycin, streptomycin, or penicillin], the cheese-maker would have trouble for several days" since residual amounts of antibiotics in milk inhibit "starter action."

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

INTESTINAL ADHESIONS TO UTERINE STUMP

Sir,—F. G. and C. M. Startup's Clinical Communication on "Bowel Resection in the Dog," in your issue of August 19th, prompts me to write of a small mongrel bitch, aged one year, which had been spayed, elsewhere, some months previously.

The bitch was brought to me suffering from an acute gastritis. An elongated mass could be palpated through the abdominal wall anterior to the pelvic brim and a diagnosis of a possible intussusception of the bowel was made. However, in view of the extremely bad condition of the bitch, through delay in having the necessary treatment, on the owner's part, it was destroyed and a *post-mortem* examination made.

There was found to be no less than a "tangle" of bowel and omentum very firmly adhering to the stump of the uterus, which would have been impossible to separate, forming almost a complete obstruction of the bowel.

It is because of the above writers' note, stating the rarity of the condition and absence of other reports, that this case was thought worthy of mention.

Yours faithfully,

P. K. Fleck.

Veterinary Practitioner.

44, Ombersley Road,
Worcester.

August 26th, 1950.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Fowl Pest	Parasitic Mange*	Sheep Scab	Swine Fever
Aug. 1st to 15th, 1950	17	—	1	—	—	8
Corresponding period in—						
1949	8	—	15	—	1	—
1948	7	—	15	—	2	—
1947	8	—	42	—	—	2
Jan. 1st to Aug. 15th, 1950	250	16	101	—	19	51
Corresponding period in—						
1949	122	11	352	—	29	5
1948	62	—	230	1	31	22
1947	63	103	696	1	35	19

Note.—The figures for the current year are approximate only.

* Excluding outbreaks in Army Horses.